

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in this application. Please amend the claims as follows:

Listing of claims:

What is claimed is:

Claims 1-18 (Cancelled).

19. (Currently Amended) A process for producing a catalyst for olefin cracking, the processing comprising the steps of:

providing an MFI type catalyst with a crystalline silicate framework;

formulating said MFI type crystalline silicate catalyst with a binder comprising silica to produce a formulated catalyst;

heating the formulated catalyst in steam to remove aluminum from the crystalline silicate framework;

extracting aluminum from the formulated catalyst by contacting the catalyst with a complexing agent to remove aluminum from pores of the framework deposited therein during the steaming step, thereby increasing the silicon/aluminum atomic ratio of the catalyst;

calcining the formulated catalyst at an elevated temperature; and

wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and extraction of aluminum has a silicon/aluminum atomic ratio of at least 120; and

wherein said catalyst is used to crack olefins.

20. (Currently Amended) The process of claim 19 wherein said silica binder is employed in an amount to provide a catalyst containing at least about 20 wt % silica, and where ~~steaming and extraction occurs before binding.~~

21. (Currently Amended) The process of claim 19 wherein said silica binder is present in an amount of about 50 wt.% silica, and where ~~steaming and extraction occurs after binding.~~

22. (Cancelled).

23. (Currently Amended) A process for producing an olefin cracking catalyst to produce ethylene and polypropylene from C₄ to C₁₀ olefins, comprising:

providing an MFI type catalyst containing aluminum and silicon in a crystalline silicate framework to provide an initial silicon/aluminum atomic ratio;

formulating said crystalline silicate catalyst with a silica binder to produce a formulated MFI type catalyst containing said MFI type crystalline silicate catalyst and the silica binder;

subsequent to the formation of said formulated MFI type crystalline silicate catalyst, subjecting said catalyst to steaming to remove aluminum from the framework of the crystalline silicate catalyst;

thereafter dealuminating said catalyst by treating said formulated catalyst with a complexing agent to remove aluminum by extraction from pores of said catalyst deposited therein during the steaming step, thereby providing a silicon/aluminum atomic ratio greater than said initial silicon/aluminum atomic ratio;

calcining said catalyst at an elevated temperature;

wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and extraction of aluminum has a silicon/aluminum atomic ratio of at least 120, and
wherein said catalyst is used to produce ethylene and polypropylene from the C₄ to C₁₀ olefins.

24. (Previously Presented) The process of claim 23 wherein said MFI type crystalline silicate catalyst at the conclusion of steaming and aluminum extraction has a silicon/aluminum atomic ratio of at least 180.

25. (Previously Presented) The process of claim 23 wherein said MFI type crystalline silicate catalyst at the conclusion of steaming and aluminum extraction has a silicon/aluminum atomic ratio of at least 300.

26. (Currently Amended) A process for producing an olefin cracking catalyst, comprising:

providing an MFI type catalyst containing aluminum and silicon in a crystalline silicate framework to provide an initial silicon/aluminum atomic ratio;

formulating said crystalline silicate catalyst with a silica binder to produce a formulated catalyst containing said MFI type crystalline silicate and the silica binder;

subsequent to the formation of said formulated MFI type crystalline silicate catalyst, subjecting said catalyst to steaming to remove aluminum from the crystalline silicate framework of the catalyst;

thereafter dealuminating said catalyst by treating said catalyst with a complexing agent to remove aluminum by extraction from pores of said catalyst deposited therein during the steaming

step, thereby providing a silicon/aluminum atomic ratio greater than said initial silicon/aluminum atomic ratio;

calcining said catalyst particles at an elevated temperature; and

wherein said MFI type crystalline silicate catalyst is a catalyst of the ZSM-5 type having an orthorhombic structure which after steaming and extracting has a silicon/aluminum atomic ratio of more than 120; and

wherein said catalyst is used to crack olefins.

27. (Cancelled).

28. (Previously Presented) The process of claim 27 wherein said MFI type crystalline silicate catalyst after aluminum extraction and steaming has a monoclinic structure.

29. (Previously Presented) The process of claim 19 wherein the catalyst is calcined after dealumination at a temperature of from 400°C to 800°C at atmospheric pressure for from 1 to 10 hours.

30. (Previously Presented) The process of claim 19 further comprising crushing the catalyst to a particle size of from 35 to 45 mesh.

31. (Previously Presented) The process of claim 19 wherein the heating in steam is carried out at a temperature of from 425°C to 870°C at a water partial pressure of from 13 kPa to 200 kPa.

32. (Previously Presented) The process of claim 19 wherein the heating in steam is carried out for a period of from 1 to 200 hours.

33. (Previously Presented) The process of claim 23 wherein the heating in steam is carried out at a temperature of from 425°C to 870°C at a water partial pressure of from 13 kPa to 200 kPa.

34. (Previously Presented) The process of claim 23 wherein the heating in steam is carried out for a period of from 1 to 200 hours.

35. (Currently Amended) The process of claim 23 wherein the catalyst is used to crack olefins are comprised of hydrocarbon feedstocks from a refinery or a steam cracking unit.

36. (Cancelled).

37. (Currently Amended) The process of claim 23 wherein the catalyst is used to crack ~~and feedstocks comprise a C₄ cut~~ from a fluidized-bed catalytic cracking (FCC) unit.

38. (Previously Presented) The process of claim 23 wherein the catalyst is used at process conditions comprising an inlet temperature of from 500°C to 600°C, an olefin partial pressure of from 0.1 to 2 bars, and an LHSV of 10 to 30 h.⁻¹.

39. (Cancelled).

40. (Previously Presented) The process of claim 28 where the crystallite size of the monoclinic crystalline silicate is 1 micron or less.

41. (Cancelled).

42. (Cancelled).

43. (Currently Amended) The process of claim 23 wherein the catalyst is used for olefins comprised of a C₄ cut from a unit within a refinery for producing methyl tert-butyl ether (MTBE).

44. (Cancelled).

45. (Cancelled).

46. (Currently Amended) The process of claim 23 wherein the catalyst is used for olefins comprised of a C₄ cut from a steam cracking unit after butadiene extraction or after butadiene hydrogenation.

47. (Currently Amended) The process of claim 23 wherein the catalyst is used for olefins comprised of light cracked naphtha (LCN) or a medium cracked naphtha.

48. (Cancelled).

49. (Currently Amended) The process of claim 23 wherein the catalyst is used for olefins comprising visbroken naphtha obtained from a visbreaking unit that treats residue from a vacuum distillation unit in an oil refinery.

50. (Previously Presented) The process of claim 23 where the catalyst is used to remove C₅ species from gasoline produced by an oil refinery.

51. (Currently Amended) The process of claim 23 where the catalyst is used to crack a feedstock comprising from 10 to 100 wt% olefins.

52. (New) A process for producing a catalyst for olefin cracking, the processing comprising the steps of:

providing an MFI type catalyst with a crystalline silicate framework;

heating the formulated catalyst in steam to remove aluminum from the crystalline silicate framework;

extracting aluminum from the formulated catalyst by contacting the catalyst with a complexing agent to remove aluminum from pores of the framework deposited therein during the steaming step, thereby increasing the silicon/aluminum atomic ratio of the catalyst;

formulating said MFI type crystalline silicate catalyst with a binder comprising silica to produce a formulated catalyst;

calcining the formulated catalyst at an elevated temperature;

wherein said MFI type crystalline silicate catalyst at the conclusion of the steaming and extraction of aluminum has a silicon/aluminum atomic ratio of at least 120; and

wherein said catalyst is used to crack olefins.

53. (New) The process of claim 52 wherein said silica binder is employed in an amount to provide a catalyst containing about 20 wt.% silica and wherein the silicalite catalyst has a monoclinic crystalline structure.

52. (New) A catalyst for cracking olefins made by the process of claim 19.

53. (New) A catalyst for cracking olefins made by the process of claim 23.

54. (New) A catalyst for cracking olefins made by the process of claim 26.

55. (New) A catalyst for cracking olefins made by the process of claim 52.

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